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ABSTRACT

Career counseling of college students requires utilization of information that considers a student's degree of comfort in an academic setting as well as their academic performance. The relationship between the Learning Environment Scale of the 1994 Strong Interest Inventory and the twelve scales of the College Student Inventory (CSI) was examined using data obtained from 115 first year students at a large Midwestern university. These students were recruited to participate in a program to enhance their academic performance and promote their career exploration. While the Learning Environment Scale offered valuable information, the findings suggest that it may not be an accurate indicator of academic comfort for first year college students. The College Student Inventory may be the more valid measure of academic comfort for this population. Research that continues to contribute to understanding the relationship between academic preferences and comfort is necessary to further illuminate and account for the occupational decision-making processes for students. Addressing the learning environment is an important consideration for college administrators for many reasons, including retention. More importantly, the environment must provide students with ample opportunities to help make future career decisions that are effective and consistent with their interests; expectations; academic comfort; and performance in related areas. (Author/JDM)

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Validating the Learning Environment Scale of the Strong Interest Inventory For Use With First Year College Students

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Poster Paper Presentation

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Abstract

Career counseling with college students requires one to utilize information obtained from a variety of sources, such as academic information and degree of comfort in an academic setting that may be useful in the career exploration and decision-making process.

The purpose of this paper is to present the results of a study investigating the relationship between the Learning Environment scale of the 1994 Strong Interest Inventory to twelve scales of the scales on the College Student Inventory (CSI).

While the Learning Environment Scale offers important information, it my not be the most accurate indicator of academic comfort for first year college students (Harmon, Hansen, Borgen & Hammer, 1994; Swanson & Hansen, 1985). The CSI may be a more valid measure of academic comfort for this population of first year college students.

It was hypothesized that each of the scales of the CSI would be positively related to the Learning Environment Scale.

The sample consisted of 115 first year students at a large Midwestern university, who were recruited to participate in a program designed to enhance their academic performance and promote career exploration and decision-making.

Results suggest that further validation of the Learning Environment scale needs to be conducted for use of this scale with first year college students.

Validating the Learning Environment Scale of the Strong Interest Inventory For Use With First Year College Students

Career counseling often overlaps with many life issues and personal concerns. Many researchers and clinicians have argued for an increased use of a variety of measures in career counseling. Spokane (1991) has been a strong advocate for using several measures of personality in career interventions. Lowman (1991) emphasized the importance of integrating many domains in the career counseling process such as abilities, interests, and personality. The 1994 revision of the Strong Interest Inventory is one such measure that includes Personal Style Scales, such as namely the Work Style Scale, the Learning Environment Scale, and the Leadership scale, and the Risk Taking/Adventure Scale. Each of these Personal Style Scales reflects Lowman's recognition of emphasis on the importance of various domains in career decision-making. The Personal Style Scales provide counselors and psychologists with opportunities for addressing education, work and personal living with an assumption that individuals' express their personalities through their occupational preferences and life choices. Thus, the Personal Style Scales address the importance of incorporating many aspects of an individual in the career decision-making process (Borgen and Harmon, 1996).

It is also apparent that the use of interest inventories alone are not sufficient to help individuals make career decisions and broaden options. This is particularly true for college age students, who are at developmental stages

that are crucial to making life long decisions. The development of interests is based on multiple influences that must be addressed by counselors and psychologists in order to effectively intervene with individuals in the career decision-making process. When working with students, it is also important for counselors to be aware of the importance of one's educational and academic comfort as an influence on career preferences and decision-making.

When working with college student populations, it is important helpful to utilize information obtained from a variety of sources. One source of information for counselors to use is the Learning Environment scale of the Strong Interest Inventory. It is important for counselors to incorporate this information into the interpretation of results to enhance the career information for the client. The Learning Environment scale is a useful scale, as it provides students with information regarding their degree of comfort in an academic setting. High scores have traditionally been are more reflective of students who are more comfortable in academic settings, while low scores are more reflective of students who may be more uncomfortable, and possibly at risk for dropping out of school (Hansen & Campbell, 1985). For the 1994 revision of the Strong Interest Inventory, the Learning Environment scale was intended to "differentiate people who prefer academic learning environments from those who prefer more practically oriented, hands-on learning situations" (Harmon, Hansen, Borgen, & Hammer, 1994, p.158). The Learning Environment Scale was reportedly developed using a contrasted groups method that identified 49 items which differentiated those with a master's or Ph.D. degree from those with a technical or trade school degree.

While the Learning Environment scale offers important information, it may not be the most accurate indicator of academic comfort for undergraduate or especially first year students. A number of problems are likely associated with the Learning Environment scale at this time. Swanson & Hansen's (1985) study found that samples of students who earned bachelors and master's degree could not be differentiated on the Academic Comfort scale of the 1985 Strong Interest Inventory (a predecessor to the Learning Environment scale correlating at .64 to .69 with the new scale but containing more science content, see Harmon et al., 1994). Further, higher scores tend to correlate with increased number of years of education. Thus, this may not be the best measure for first year students still in school. Swanson & Hansen (1985) also found that students who scored in the lowest quartile on the Academic Comfort scale still had adequate grade point averages. Finally, they found differences in scores related to students' educational expectations, with higher expectations correlating with higher scores on the scale thereby, potentially yielding confusing information to an individual. A further limitation of the Learning Environment scale is that the normative sample is based on individuals obtaining Ph.D. degrees, who are tenured, employed adults. Indeed, the test manual suggests that college students are likely to score as much as one standard deviation below the normative sample (Harmon, et al., 1994). Yet, Harmon and her colleagues did report that the Learning Environment scale produced large mean differences across educational majors in predictable ways.

These limitations of this scale offer support emphasize the need for continued research and validation of the scale for use with college students, particularly first year

students, who may need more intense career interventions and retention programs. In fact, little independent research has emerged on the Learning Environment scale as distinct from the old Academic Comfort Scale. Thus, the validity of the Learning Environment scale for first year students may continue to be questionable, as well as and its use potentially confusing for many individuals in general.

The purpose of this poster session will be to present the results of a pilot study investigating the relationship between the Learning Environment scale of the 1994 Strong Interest Inventory to twelve scales of the scales on the College Student Inventory (CSI). The CSI is a measure that may be more been widely appropriate for use used with first year college students.

The College Student Inventory (CSI) is a 194-item questionnaire that enables counselors to assess students' academic, career and personal needs. This questionnaire yields information regarding students who may be at risk for academic, career or personal difficulties. Risk factors that the CSI may reveal include weak educational goals/values, poor study habits, first-generation college student, undecided major and low receptivity for receiving institutional help. There are a total of twenty scales on the CSI of which this study will look at the relationship between the Learning Environment scale of the Strong Interest Inventory and the following scales of the CSI (study habits, intellectual interests, academic confidence, desire to finish college, attitude toward educators, ease of transition, openness, career planning, receptivity to support services, academic assistance, personal counseling, and career

counseling). It is hypothesized that each of these scales will be positively related to the Learning Environment scale.

Program:

First year college students were recruited to participate in a ten-hour college success program. All entering first year students at a large Midwestern university were mailed a brochure about the program. The program required a minimal fee. All participants were self-selected and participated on a voluntary nature. The program offered a ten-hour intensive instruction/training, with a four-hour intensive training session prior to the start of the first semester classes. The program instruction and training emphasized self-awareness through the assessments, setting and achieving goals; learning effective study skills and learning skills to manage academic stress and anxiety. Additional content included midterm study skill reviews, time management strategies, and reviews of campus resources. Finally, discussion of career exploration and planning, based on assessment results was conducted. All students were given the College Student Inventory, the Learning & Study Strategies Inventory and the Strong Interest Inventory. However, the Strong Interest Inventory was given at a later date than the other two assessments, resulting in a reduction in the total number of Strong Interest Inventories to be included in the total sample.

Sample:

The sample consisted of first year students at a large Midwestern university, who were recruited to participate in a program designed to enhance their academic performance, ease their transition to the university, and promote career exploration and

decision-making. A total of 115 students comprised the sample. Students of color represented 14.7% of the participant group with African Americans comprising 1.7%, Asians 7.8%, Hispanic/Latino 2.6%, and Caucasians representing 81.7%. Summary results of the College Student Inventory suggest that participants had the following characteristics: 26% had a high risk for college drop out; 54% indicated that they would benefit from career counseling; 30% indicated a need for academic assistance, and 33% indicated that they would benefit from personal counseling.

Method:

All subjects enrolled in the intervention program were asked to complete the CSI and the LASSI prior to the first training session. Results of these two assessments were interpreted with subjects at a four hour training session. Subjects were then asked to return for three additional training sessions and were asked to complete the Strong Interest Inventory at one of these three times. Subjects were also mailed a letter and called numerous times to increase the completion rate. A total of 115 students had complete data for the CSI and the LASSI. Unfortunately, only 31 students completed the Strong Interest Inventory. A total of 31 subjects were used to analyze the data. Because of the limited data returned for the Strong Interest Inventory, the Learning Environment Scale was separated into three groups based on the overall score. Learning group one included subjects who scored less than 40 (N = 10). Learning group two included subjects who scored between 40 and 49 (N = 15). Finally, learning group three included subjects who scored 50 or more (N = 6). It should be noted that high scores on the Learning Environment scale have traditionally been more reflective of students who are

more comfortable in academic settings, as opposed to lower scores being more reflective of students who may be more uncomfortable, and possibly at risk for dropping out of school (Hansen & Campbell, 1985). An ANOVA was conducted to test the hypothesis that there would be no differences between the scales of the CSI, LASSI and Strong Interest Inventory with respect to the Learning Environment Scale.

Results:

The results of this study should be interpreted with caution due to the very limited sample size. The authors caution that this study should be viewed as a pilot project and are hopeful with respect to obtaining a large sample size in the future, as the program will continue. Overall, the results of the ANOVA revealed only three significant differences. There was a significant difference between the Artistic scale and the Leaning Environment Scale or (Learning Style Group) $F(2, 28) = 5.10$, $p = .013$. There was also a significant difference between the Predicted Academic Difficulty scale and Learning Style Group $F(2, 28) = 4.26$, $p = .024$. Finally, there was a significant difference between Intellectual Interests and Learning Style Group $F(2, 28) = 3.69$, $p = .038$. The first table included in this paper reports the means and ANOVA results.

Additional graphs showing the profile results of each of the three assessments (CSI, LASSI, and Strong Interest Inventory) compared to the three Learning Style groups are also included. These results have been included merely for additional information and suggest some interesting findings, however, these results will not be discussed in great detail in this paper due to the limited sample size and nonsignificant results.

Conclusions:

It was hoped that the results of this study would produce evidence that the Learning Environment scale is a valid and appropriate measure of academic comfort for use with first year college students. Unfortunately, the results did not provide significant results to support the validity of the Learning Environment Scale in relation to the College Student Inventory Scales as a sound measure of academic comfort for use with first year college students.

Research that continues to contribute to our understanding of the relationships between academic preferences and comfort is necessary to further understand and account for the occupational decision making processes for students. Addressing the learning environment is important for many reasons such as retention, but most importantly to provide students with ample opportunities to make future career decisions that are effective and consistent with their interests, self-efficacy, expectations, and academic comfort and performance in related areas.

It is apparent that this pilot study had many limitations, particularly the small sample size of data for the Learning Environment scale and limited generalizability for use with various ethnic populations. However, the results do offer further support for the hypothesis that the Learning Environment scale may not be appropriate for use with first year college students and does indeed need further validation for use with this population. The results may also imply that the CSI is in fact, a good measure academic comfort and learning style that may be superior to the Learning Style scale of the Strong Interest Inventory.

It is apparent that achievement and career development of individuals varies considerably. Educational and counseling practices need to adequately meet the needs of all individuals, to prepare them with academic and career decision making skills that are needed for achievement and success in the highly technological society that we live in. Only when these processes and influences are addressed, understood, and incorporated into learning and counseling environments will career counseling practices be the most effective and successful.

In conclusion, it is hoped that this poster presentation has provided results that support the continued emphasis for more research and further validation of the Learning Environment scale of the Strong Interest Inventory in the career counseling process, and confidence in the measure for use with a first year college student population. While the results are limited, they do offer support for the continuation of further research of this scale as well as a greater understanding about the factors that influence academic achievement and career decision-making of first year college students.

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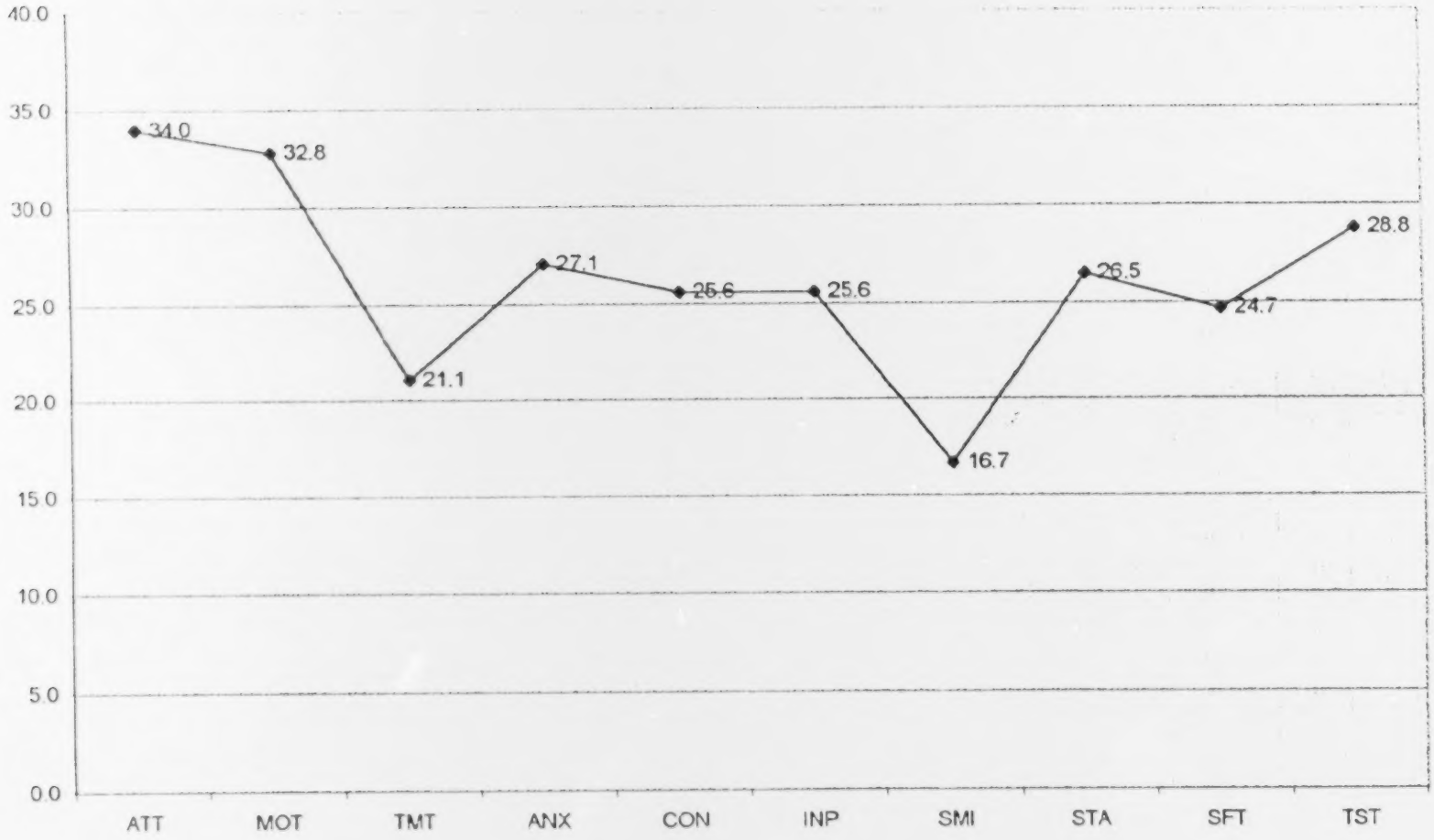
MEAN COMPARISONS: ANOVA TABLE

VARIABLE * LEARNGRP	MEAN	*F*	*p*	
REALISTIC	43.3	.0682	0.5136	
INVESTIGATIVE	44.8	.7271	0.4922	
ARTISTIC	45.4	5.0971	0.0129	*
SOCIAL	48.5	0.0199	0.9802	
ENTERPRISING	49.6	0.2602	0.7727	
CONVENTIONAL	47.5	0.0404	0.9605	
LEARNING	43.2	64.3172	0.0000	
WORKSTYLE	53.6	0.4276	0.6563	
LEADERSHIP	47.1	2.2927	0.1196	
RISK TAKING	50.0	0.3724	0.6924	
ATTTITUDE	33.0	1.1941	0.3180	
MOTIVATION	31.5	0.6162	0.5472	
TIME MANAGEMENT	23.6	1.5863	0.2223	
ANXIETY	28.0	0.5559	0.5798	
CONCENTRATION	26.8	0.3746	0.6909	
INFORMATION PROCESSING	26.4	0.9131	0.4129	
SELECTION OF MAIN IDEAS	17.5	0.5220	0.5990	
STUDY AIDS	25.8	0.9199	0.4508	
SELF TESTING	24.9	0.4603	0.6358	
TEST STRATEGIES	29.3	0.4744	0.6272	
DROP OUT PRONENESS	4.8	2.2253	0.1268	
PREDICTED ACADEMIC DIFFICULTY	5.4	4.2633	0.0242	*
EDUCATIONAL STRESS	4.6	3.0361	0.0641	
RECEPTIVITY TO HELP	5.3	0.3185	0.7298	
STUDY HABITS	45.8	1.4339	0.2553	
INTELLECTUAL INTERESTS	39.8	3.6883	0.0379	*
ACADEMIC CONFIDENCE	60.3	1.1848	0.3207	
DESIRE TO FINISH COLLEGE	55.6	1.2968	0.2893	
ATTITUDE TOWARD EDUCATORS	49.5	2.1319	0.1375	
SELF RELIANCE	49.9	1.1106	0.3434	
SOCIABILITY	65.3	1.8453	0.1767	
LEADERSHIP	60.5	1.9603	0.1597	
EASE OF TRANSITION	44.5	0.3788	0.6881	
FAMILY EMOTIONAL SUPPORT	47.2	1.7390	0.1941	
OPENESS	51.7	1.7876	0.1859	
CAREER PLANNING	36.3	1.4739	0.2463	
FINANCIAL SECURITY	51.7	3.2774	0.0526	
ACADEMIC ASSISTANCE	57.0	0.7481	0.4825	
PERSONAL COUNSELING	46.6	0.4538	0.6398	
SOCIAL ENRICHMENT	55.7	0.2890	0.7512	
CAREER COUNSELING	55.2	0.0724	0.9303	

LASSI Profile for Learning Style Group One



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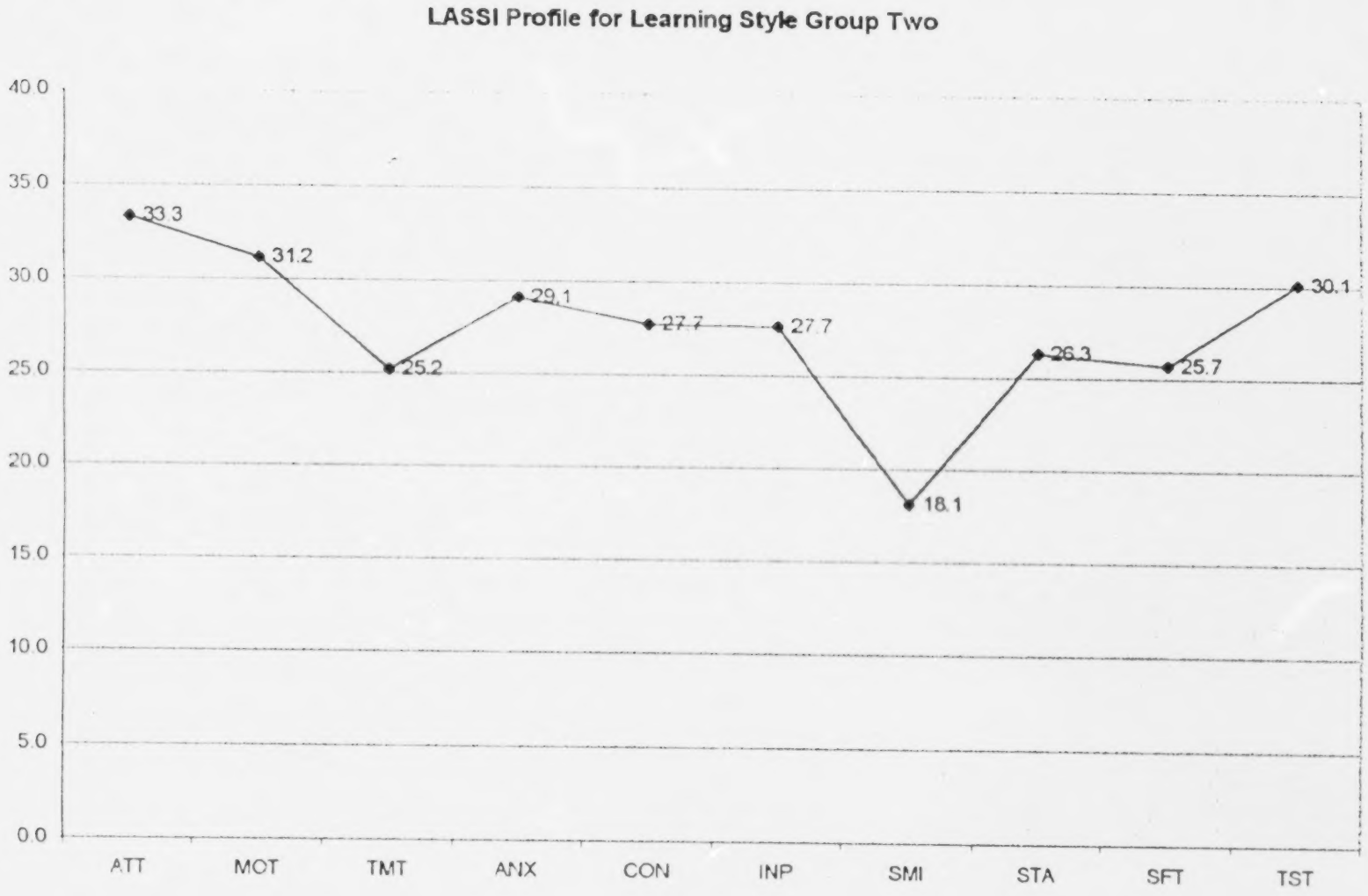
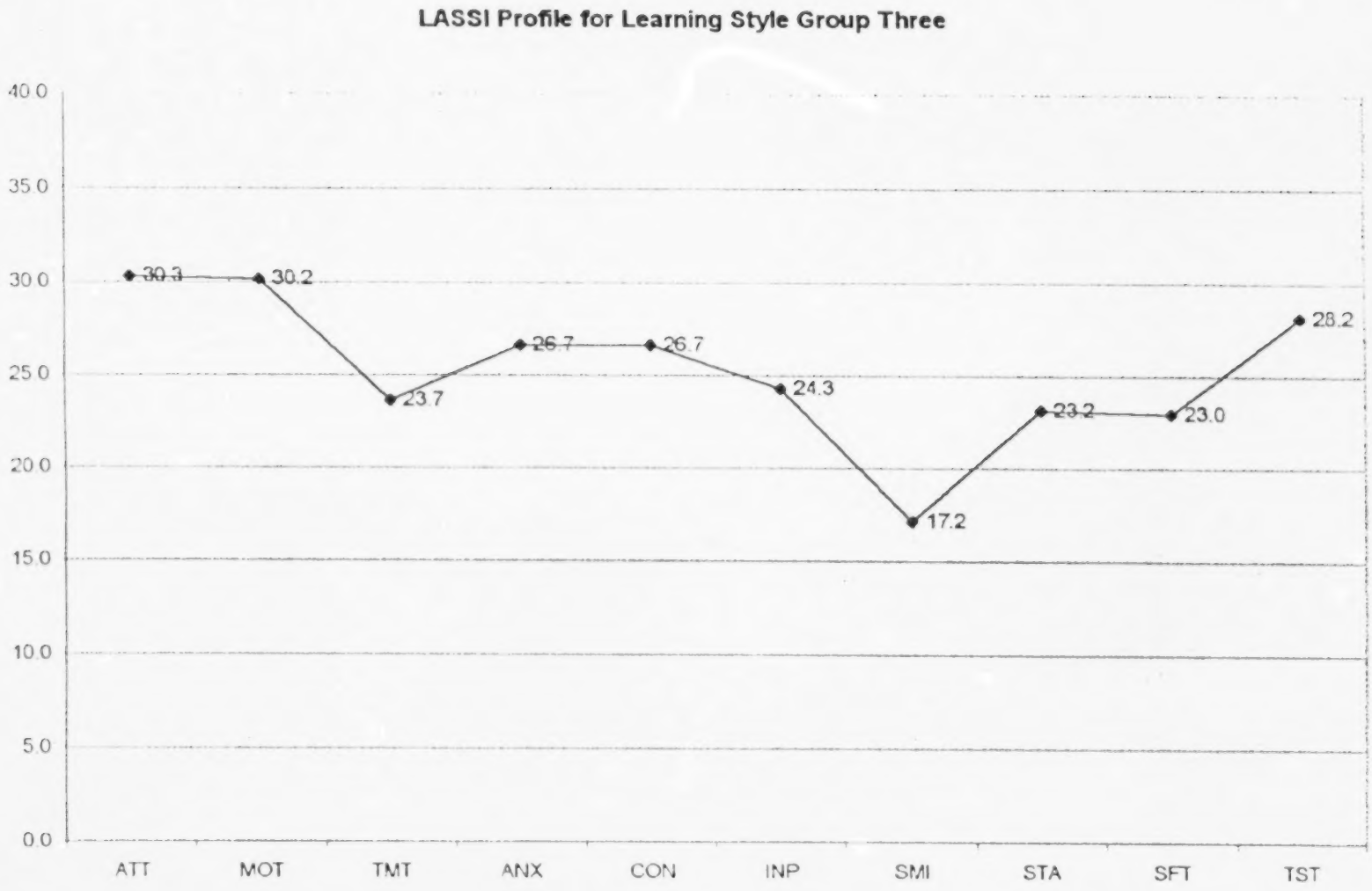
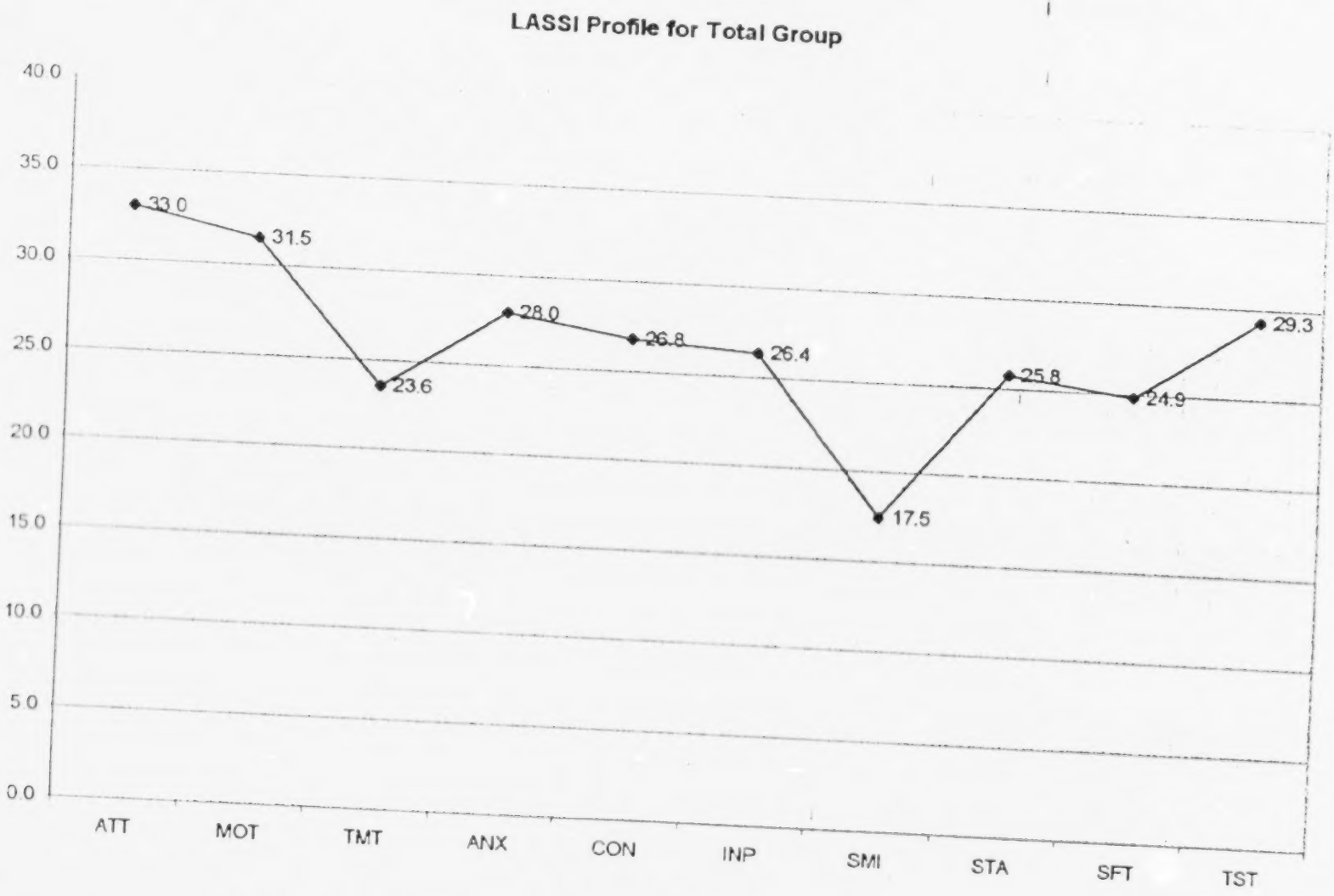
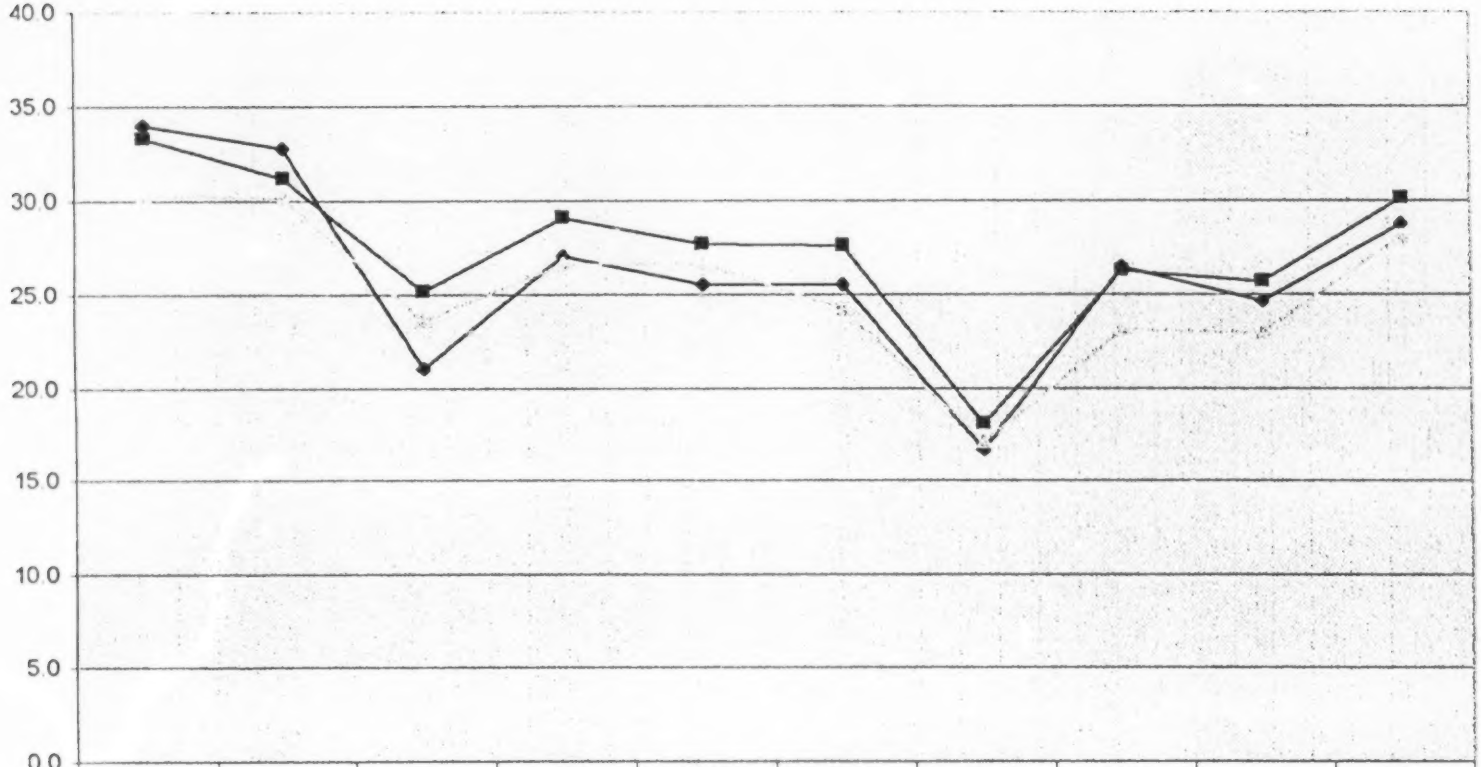

LASSI Profile for Learning Style Group Two
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
33.3
31.2
25.2
29.1
27.7
27.7
18.1
26.3
25.7
30.1
ATT
MOT
TMT
ANX
CON
INP
SMI
STA
SFT
TST

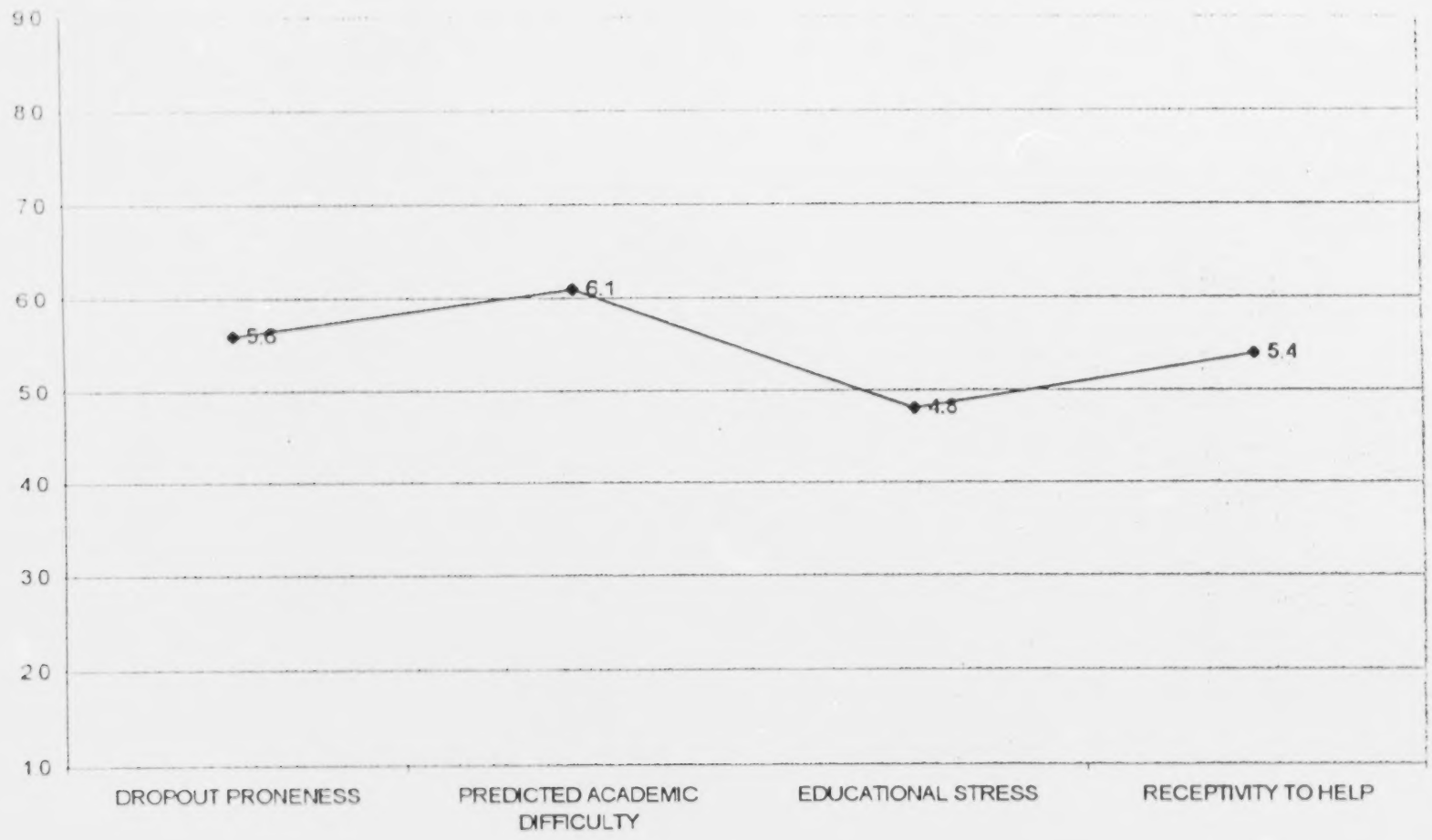

LASSI Profile for Learning Style Group Three
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
30.3
30.2
23.7
26.7
26.7
24.3
17.2
23.2
23.0
28.2
ATT
MOT
TMT
ANX
CON
INP
SMI
STA
SFT
TST

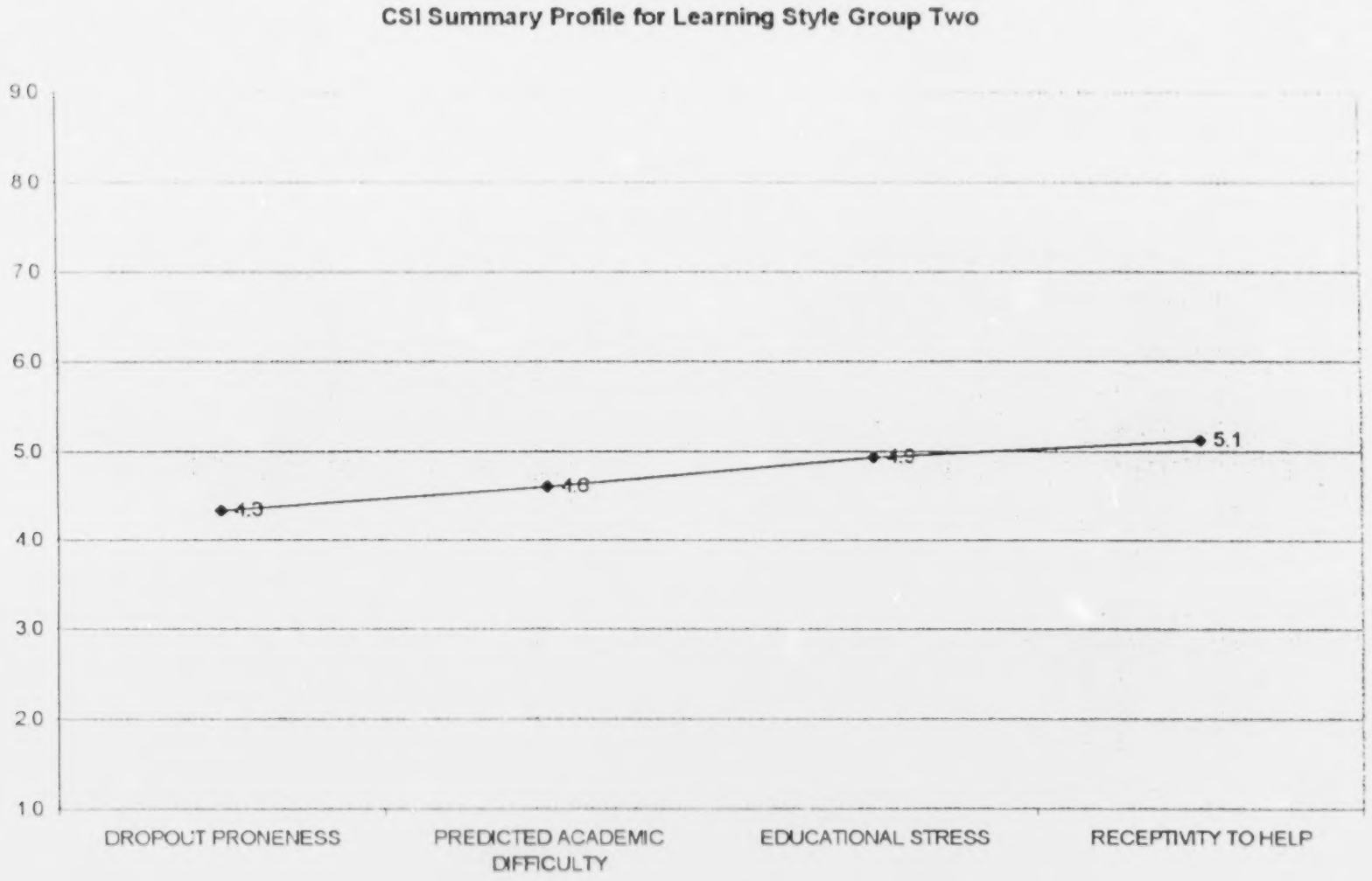

LASSI Profile for Total Group
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
33.0
31.5
23.6
28.0
26.8
26.4
17.5
25.8
24.9
29.3
ATT
MOT
TMT
ANX
CON
INP
SMI
STA
SFT
TST

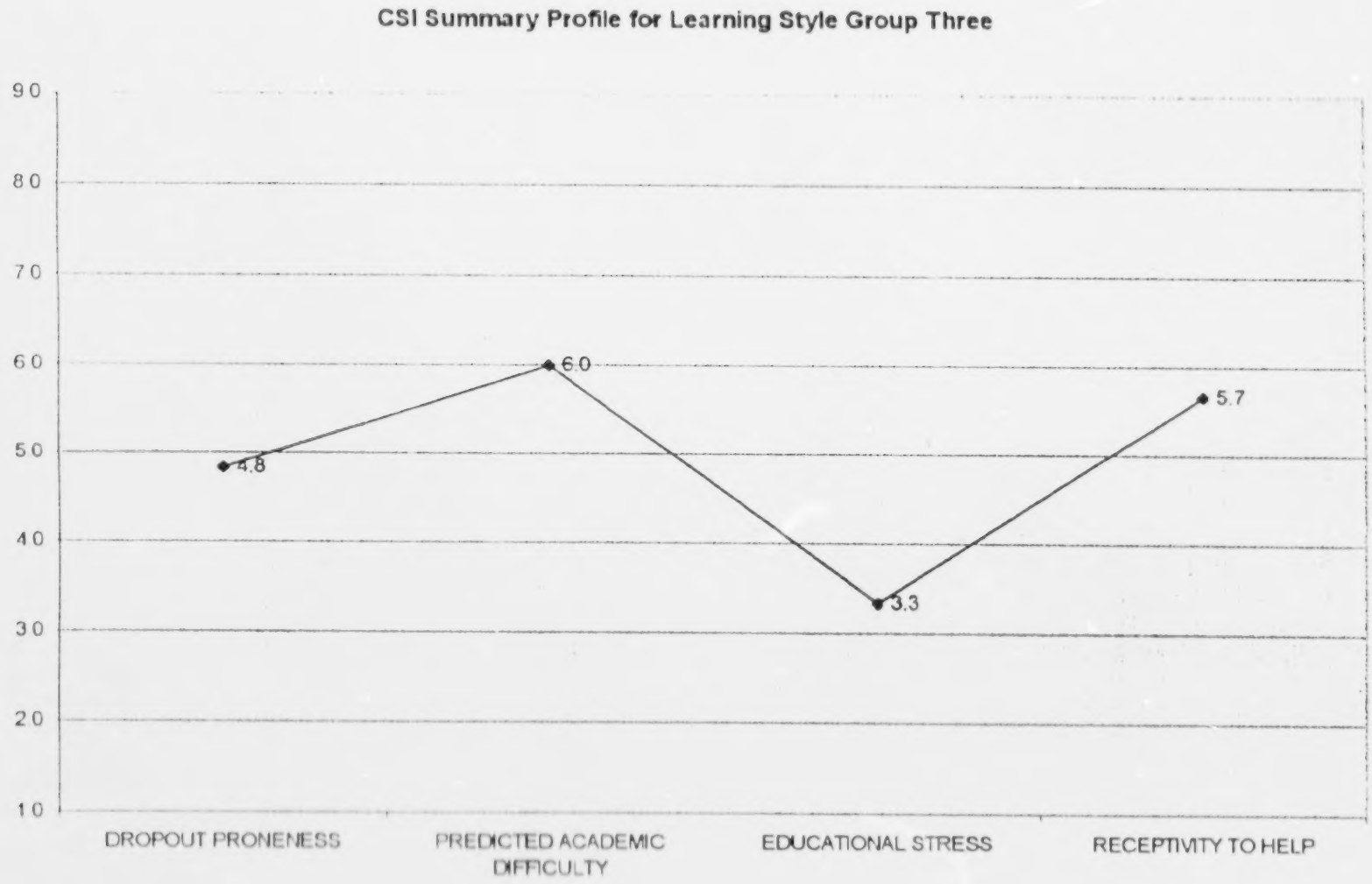
LASSI Profile Comparison

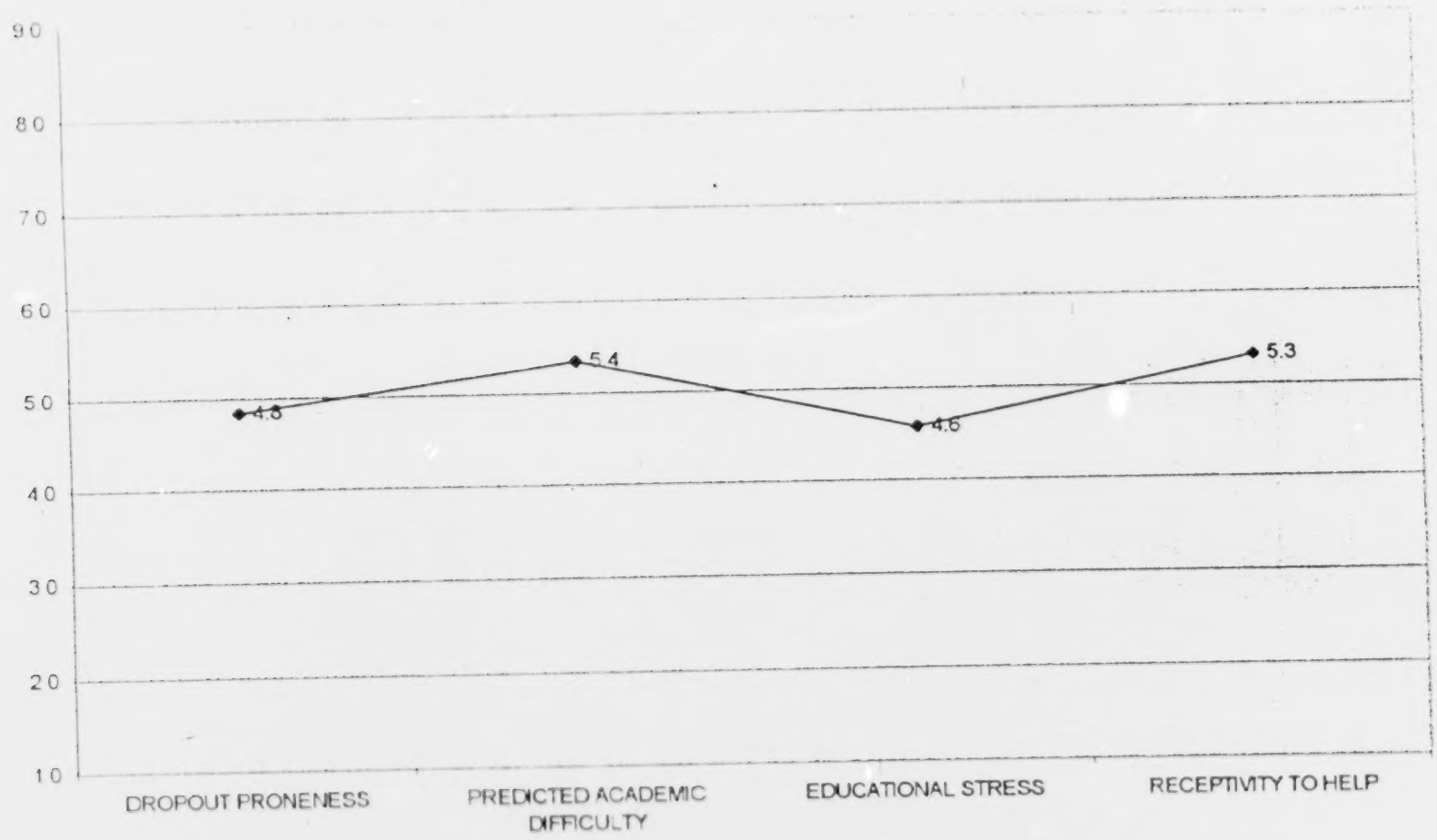


	ATT	MOT	TMT	ANX	CON	INP	SMI	STA	SFT	TST
Series1	34.0	32.8	21.1	27.1	25.6	25.6	16.7	26.5	24.7	28.8
Series2	33.3	31.2	25.2	29.1	27.7	27.7	18.1	26.3	25.7	30.1
Series3	30.3	30.2	23.7	26.7	26.7	24.3	17.2	23.2	23.0	28.2

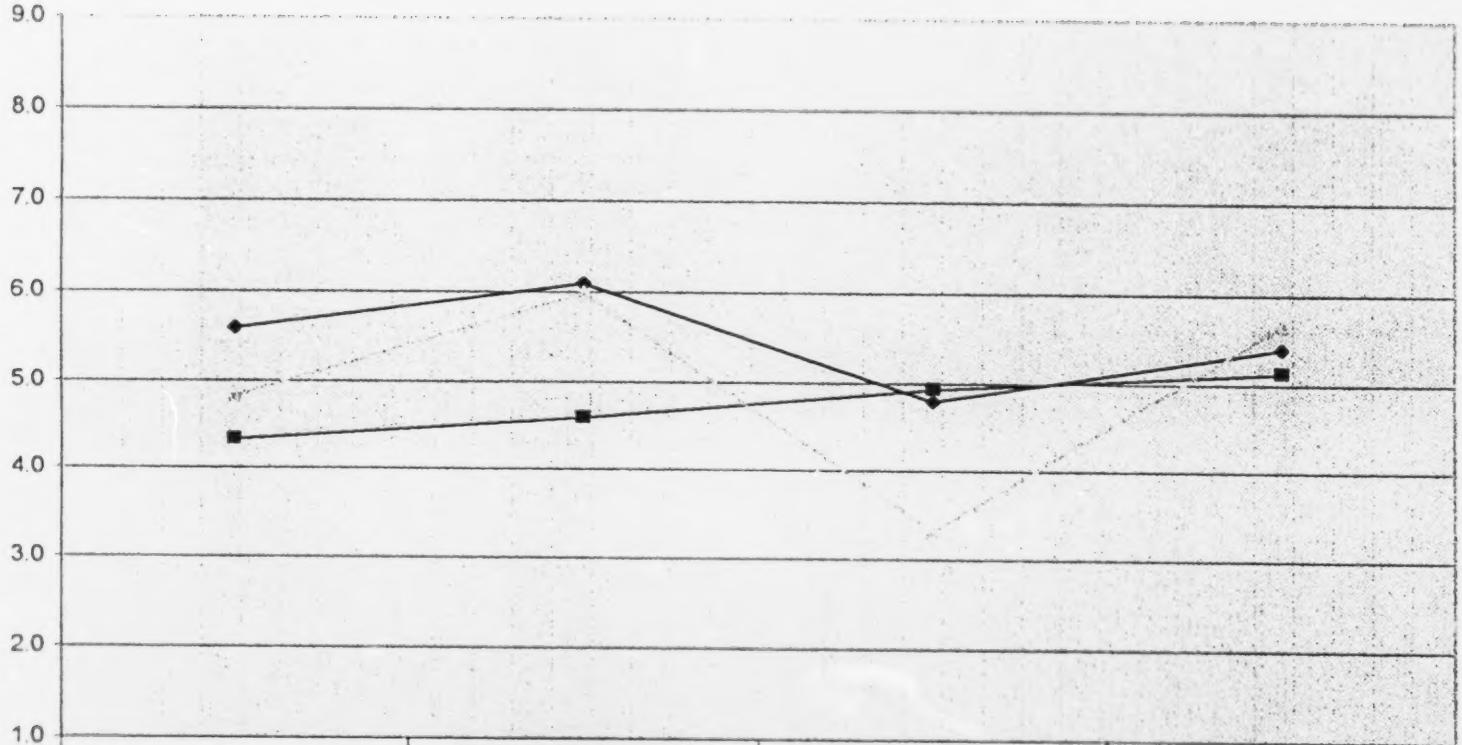

CSI Summary Profile for Learning Style Group One
90
80
70
60
50
40
30
20
10
5.6
6.1
4.8
5.4
DROPOUT PRONENESS
PREDICTED ACADEMIC DIFFICULTY
EDUCATIONAL STRESS
RECEPTIVITY TO HELP


CSI Summary Profile for Learning Style Group Two
90
80
70
60
50
40
30
20
10
4.3
4.6
4.9
5.1
DROPOUT PRONENESS
PREDICTED ACADEMIC DIFFICULTY
EDUCATIONAL STRESS
RECEPTIVITY TO HELP


CSI Summary Profile for Learning Style Group Three
90
80
70
60
50
40
30
20
10
4.8
6.0
3.3
5.7
DROPOUT PRONENESS
PREDICTED ACADEMIC DIFFICULTY
EDUCATIONAL STRESS
RECEPTIVITY TO HELP

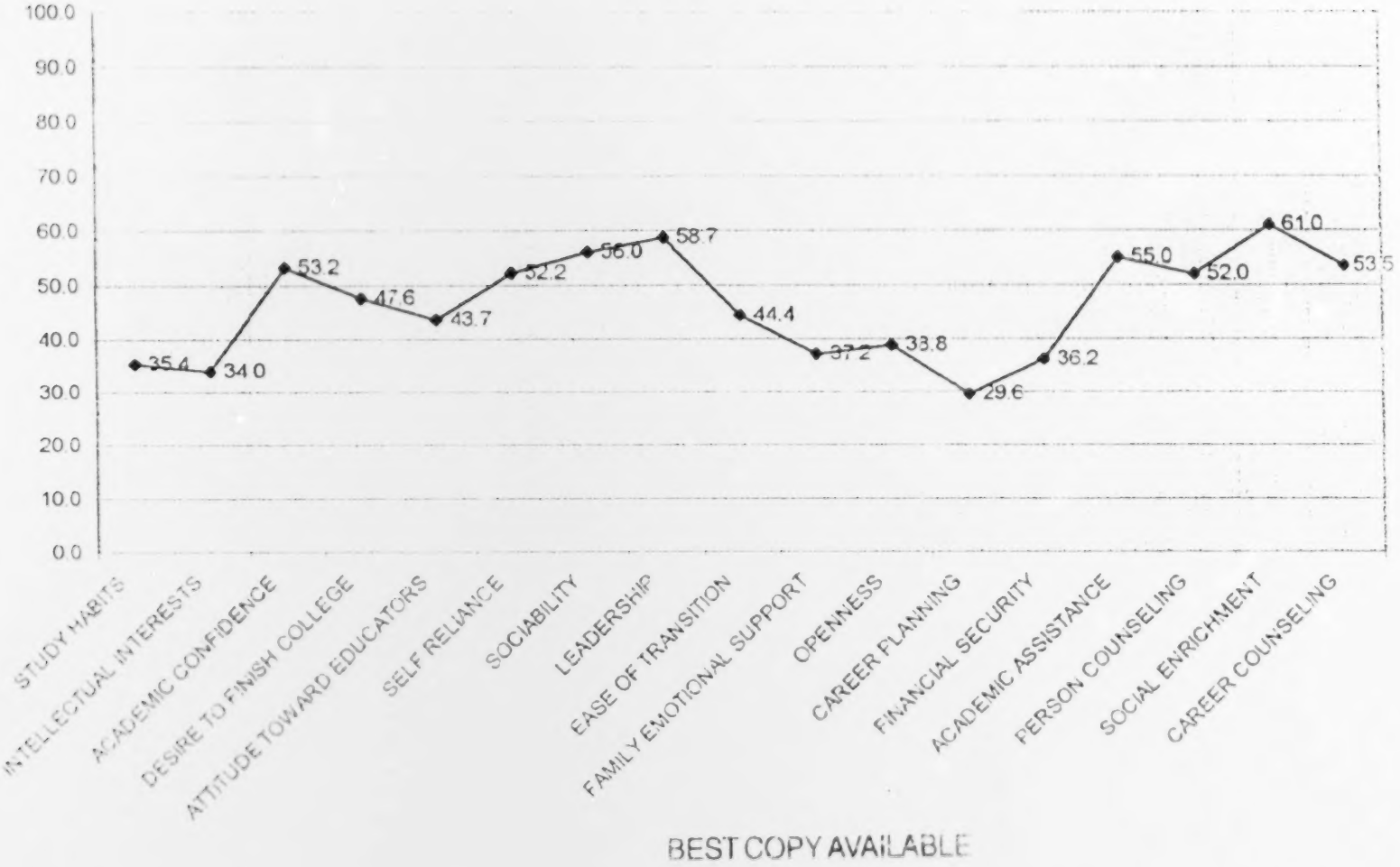

CSI Summary Profile for Total Group
90
80
70
60
50
40
30
20
10
4.8
5.4
4.6
5.3
DROPOUT PRONENESS
PREDICTED ACADEMIC DIFFICULTY
EDUCATIONAL STRESS
RECEPTIVITY TO HELP

CSI Summary Profile Comparison



	DROPOUT PRONENESS	PREDICTED ACADEMIC DIFFICULTY	EDUCATIONAL STRESS	RECEPTIVITY TO HELP
Series1	5.6	6.1	4.8	5.4
Series2	4.3	4.6	4.9	5.1
Series3	4.8	6.0	3.3	5.7

CSI Profile for Learning Style Group One



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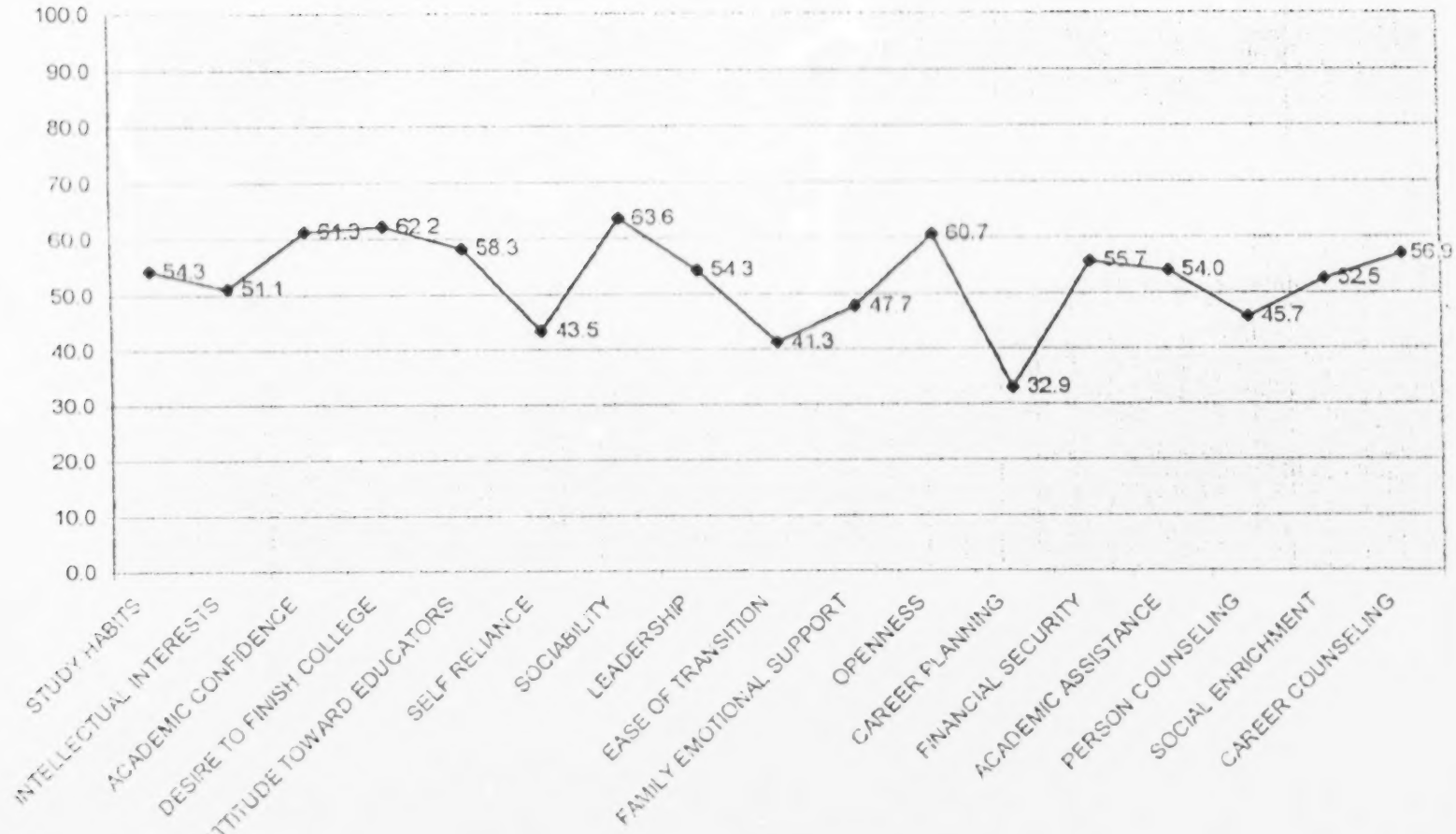
CSI Profile for Learning Style Group Two



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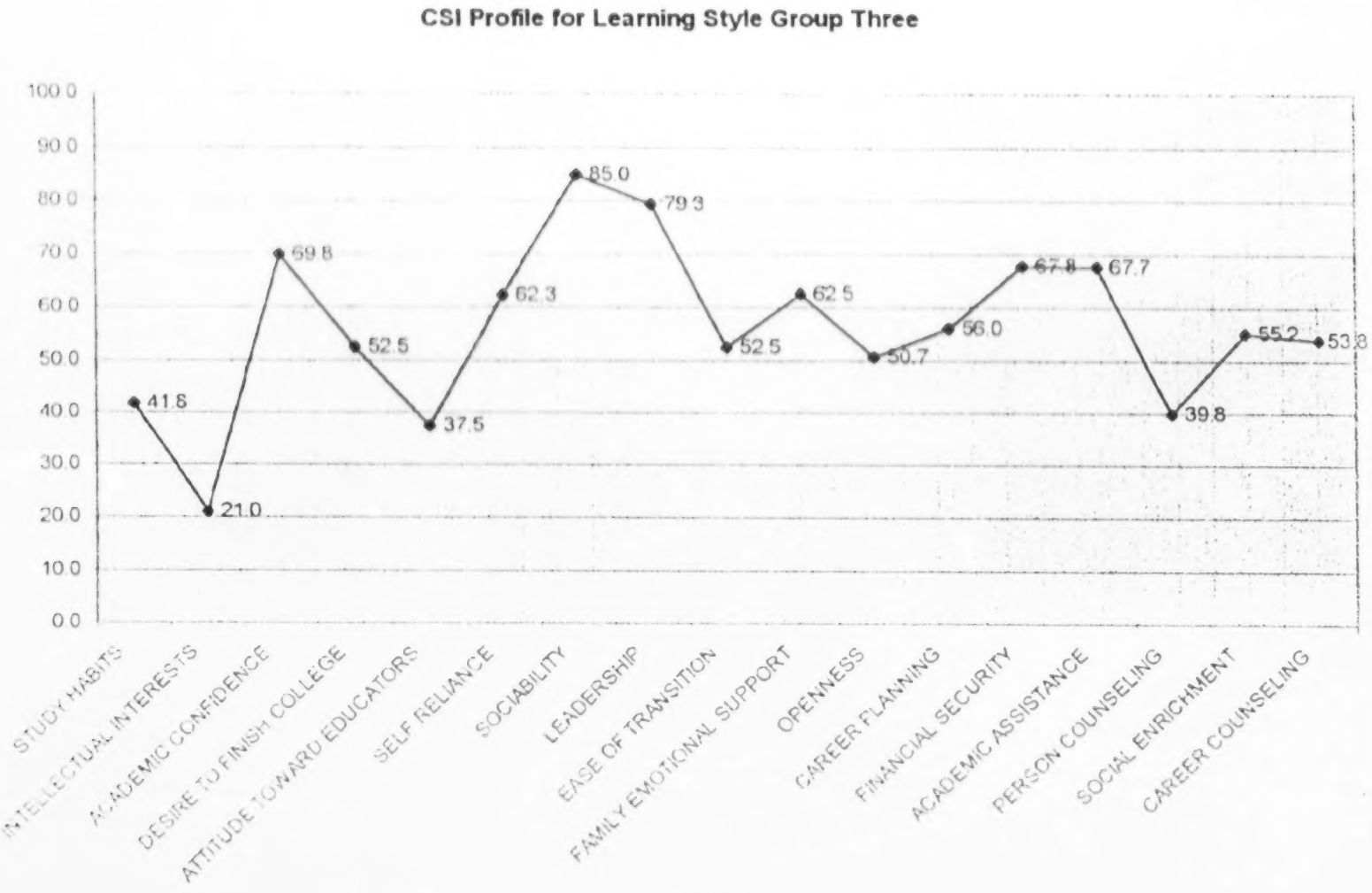

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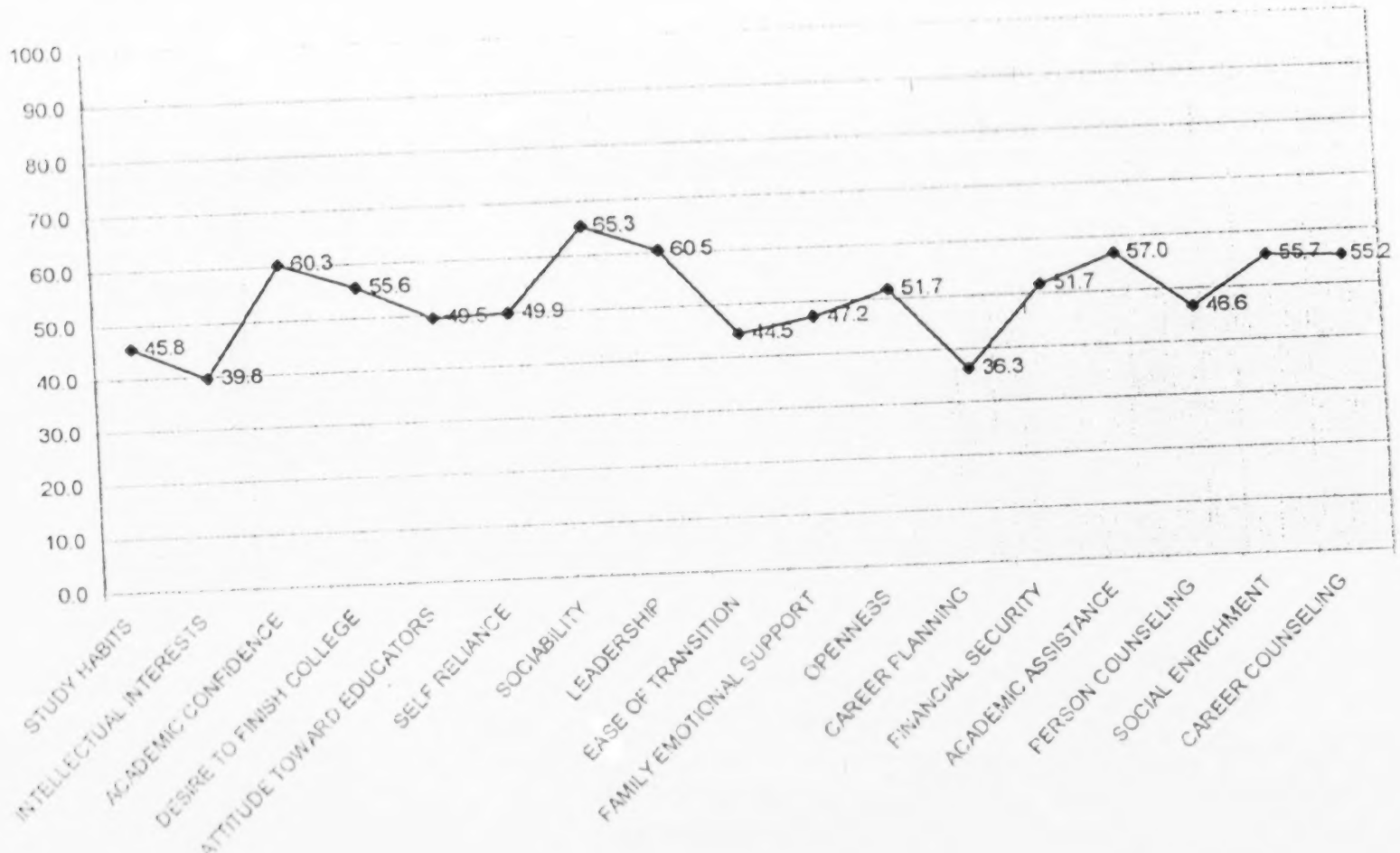

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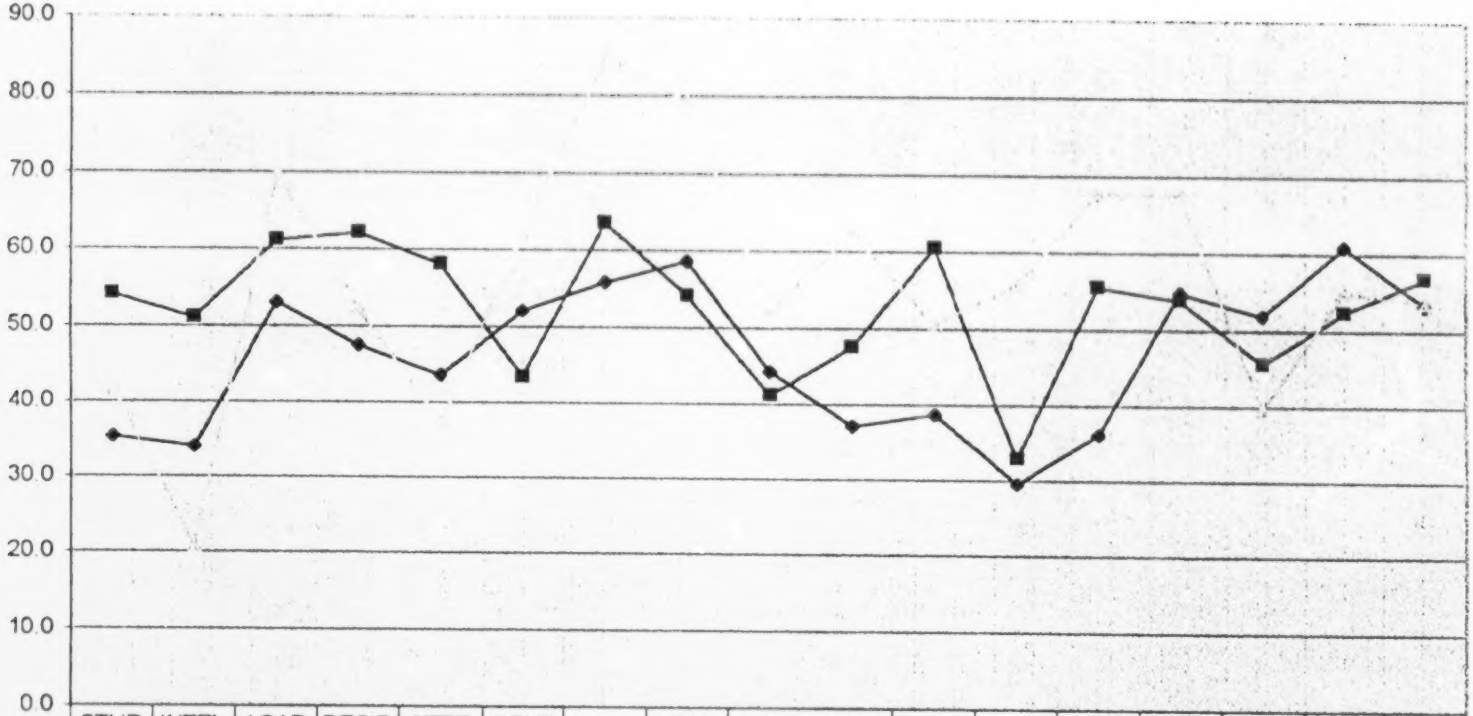
CSI Profile Comparison



	STUDY HABIT	INTELLECTUAL	ACADEMIC CONFI	DESIRE TO FINIS	ATTITUDE TOWA	SELF RELIANCE	SOCIABILITY	LEADERSHIP	EASE OF TRAN	FAMILY EMOTI	OPENNESS	CAREER PLAN	FINANCIAL SECU	ACADEMIC ASSIS	PERSON COUN	SOCIAL ENRIC	CAREER COUN
Series1	35.4	34.0	53.2	47.6	43.7	52.2	56.0	58.7	44.4	37.2	38.8	29.6	36.2	55.0	52.0	61.0	53.5
Series2	54.3	51.1	61.3	62.2	58.3	43.5	63.6	54.3	41.3	47.7	60.7	32.9	55.7	54.0	45.7	52.5	56.9
Series3	41.8	21.0	69.8	52.5	37.5	62.3	85.0	79.3	52.5	62.5	50.7	56.0	67.8	67.7	39.8	55.2	53.8